

IN THE CLAIMS:

1. (Currently Amended) A process for machining workpieces with a moving laser beam, the process comprising:

holding a laser tool, that emits the laser beam, by a multiaxial mechanical manipulator at a manipulator hand at a spaced location above the workpiece;

5 moving the laser tool along a predetermined path along the workpiece by a displacing motion of the manipulator and during the displacing motion of the manipulator; and

superimposing a compensating motion of the laser beam to the displacing motion during the displacing motion with the compensating motion being at least partially oppositely directed to the displacing motion wherein the compensating motion of the laser beam is performed by a pivoting motion of the manipulator hand about a hand axis; and

continuously displacing the laser tool with the displacing motion of the manipulator during an intermittent machining of the workpiece in which machining phases and transport phases alternate.

2. (Currently Amended) A process in accordance with claim 1, wherein the workpiece is machined intermittently, while machining phases and transport phases alternate, wherein during intermittent machining, the point at which the laser beam reaches the surface gets ahead of the laser tool or the low end of a flange system of coordinates at the beginning of a machining phase and trails it at the end of the machining phase.

3. (Previously Presented) A process in accordance with claim 1, wherein an at least partially transversely directed compensating motion of the laser beam is further superimposed to the displacing motion during the machining operation.

4. (Previously Presented) A process in accordance with claim 1, wherein a velocity of displacement V_r of the displacing motion of the manipulator displacing the laser tool is greater than an oppositely directed compensating velocity V_w of the compensating motion.

5. (Previously Presented) A process in accordance with claim 1, wherein a velocity of displacing motion V_r of the manipulator displacing the laser tool is greater than a machining velocity V_s of the laser beam at the workpiece .

6. (Canceled)

7. (Canceled)

8. (Previously Presented) A process in accordance with claim 1, wherein the laser tool is held by means of a extension arm at a spaced location from the manipulator hand.

9. (Canceled)

10. (Currently Amended) A process in accordance with claim 1, wherein the laser beam is directed toward the workpiece at the beginning of each machining phase with an obliquely forwardly directed beam angle α, α' .

11. (Currently Amended) A process in accordance with claim 1, wherein the laser beam is directed toward the workpiece at the end of the each machining phase with an obliquely rearwardly directed beam angle β, β' .

12. (Previously Presented) A process in accordance with claim 1, wherein the manipulator performs an essentially constant displacing motion during the machining.

13. (Previously Presented) A process in accordance with claim 1, wherein the manipulator performs an essentially constant or accelerated displacing motion during the transport phases between the machinings.

14. (Currently Amended) A device for machining workpieces with a moving laser beam, the device comprising:

a multiaxial mechanical manipulator;
a manipulator hand having at least one hand axis, the manipulator hand being connected to the multiaxial mechanical manipulator for pivoting relative to the multiaxial mechanical manipulator about the at least one hand axis;

a laser tool held by a multiaxial mechanical manipulator at a the manipulator hand[[],];
a control for controlling said multiaxial mechanical manipulator, for controlling said
manipulator hand for movement about the at least one said hand axis controlled independently
10 from a displacing motion of the multiaxial manipulator and for for controlling said laser tool,
said laser tool being movable along a preset path during a displacing motion of the manipulator
and multiaxial mechanical manipulator being controlled for moving the laser tool along the
predetermined path along the workpiece by the displacing motion of the manipulator during
the displacing motion of the manipulator, the manipulator hand having a means being
15 controlled for generating a compensating motion of the laser beam, which said motion takes
place during the machining operation and is directed opposite to the displacing motion and is
superimposed to the displacing motion and includes superimposing the at least partially
oppositely directed compensating motion of the laser beam to the displacing motion during the
machining operation wherein the compensating motion of the laser beam is performed by a
20 pivoting motion of the manipulator hand about the at least one said hand axis, said laser tool
being controlled to provide intermittent machining and each of the multiaxial mechanical
manipulator the manipulator hand and the laser tool being controlled for continuously
displacing the laser tool with the the displacing motion during intermittent machining of the
workpiece with the displacing motion and the at least partially oppositely directed
25 compensating motion in which machining phases and transport phases alternate.

15. (Canceled)

16. (Previously Presented) A device in accordance with claim 14, wherein the laser tool is mounted on the manipulator hand by means of an extension arm that creates a distance.

17. (Previously Presented) A device in accordance with claim 14, wherein the laser tool has a focusing optical system for generating a fixed-angle laser beam.

18. (Previously Presented) A device in accordance with claim 14, wherein the laser tool has a fixed focal distance.

19. (Previously Presented) A device in accordance with claim 14, wherein the laser tool has a focal distance of approx. 150 mm to 400 mm.

20. (Canceled)

21. (Canceled)

22. (Currently Amended) A device in accordance with claim 14, wherein the laser tool is designed as comprises a welding tool.

23. (Canceled)

24. (New) A process for machining said workpieces with a moving laser beam, the process comprising:

providing a multiaxial mechanical manipulator with a connected manipulator hand having at least one hand axis, the manipulator hand being connected to the multiaxial mechanical manipulator for pivoting relative to the multiaxial mechanical manipulator about the at least one hand axis;

holding a laser tool at the manipulator hand and maintaining the laser at a spaced location above the workpiece;

moving the laser tool along a predetermined path along the workpiece by a displacing motion of the manipulator and during the displacing motion of the manipulator to provide a displacing motion velocity of the moving laser tool relative to the workpiece;

superimposing a compensating motion of the laser beam to the displacing motion during the displacing motion with the compensating motion being at least partially oppositely directed to the displacing motion wherein the compensating motion of the laser beam is performed by a pivoting motion of the manipulator hand about one hand axis providing machining with the laser machining location moving at a machining velocity; and

machining the workpiece with the laser tool machining the workpiece at the machining velocity while regulating the displacing motion of the manipulator such that the displacing motion velocity is greater than the machining velocity of the laser beam at the workpiece during machining of the workpiece.

25. (New) A process in accordance with claim 24, wherein the workpiece is machined intermittently, while machining phases and transport phases alternate, wherein during intermittent machining the laser tool is continuously displaced with a continuous displacing motion of the manipulator.

26. (New) A process in accordance with claim 24, the displacing motion velocity is greater than an oppositely directed compensating velocity of the compensating motion.

27. (New) A process in accordance with claim 24, wherein:
the laser beam is directed toward the workpiece at the beginning of machining with an obliquely forwardly directed beam angle α α' ; and
the laser beam is directed toward the workpiece at the end of the machining with an obliquely rearwardly directed beam angle β , β' .

5 28. (Previously Presented) A process in accordance with claim 1, wherein:
the manipulator performs an essentially constant displacing motion during the machining; and
the manipulator performs an essentially constant or accelerated displacing motion during the transport phases between the machinings.

29. (New) A device for machining workpieces with a moving laser beam, the device

comprising:

a multiaxial mechanical manipulator;

5 a manipulator hand having at least one hand axis, the manipulator hand being connected to the multiaxial mechanical manipulator for pivoting relative to the multiaxial mechanical manipulator about the at least one hand axis;

a laser tool held by the manipulator hand; and

10 a control for controlling said multiaxial mechanical manipulator for moving the laser tool along a predetermined path along the workpiece by a displacing motion of the multiaxial manipulator to provide a displacing motion velocity of the moving laser tool relative to the

workpiece and controlling said manipulator hand independently from the displacing motion for superimposing a compensating motion of the laser beam to the displacing motion during the displacing motion with the compensating motion being at least partially oppositely directed to the displacing motion wherein the compensating motion of the laser beam is performed by

15 a pivoting motion of the manipulator hand about one hand axis providing control of machining movement with the laser machining location of the laser beam moving at a machining velocity with the displacing motion velocity greater than the machining velocity of the laser beam at the workpiece during machining of the workpiece.

30. (New) A device in accordance with claim 30, wherein the laser tool is mounted on the manipulator hand by means of an extension arm that creates a distance.